

Remarks

Status of the Application

Claims 15-36 were pending in the application at the time the Office Action was mailed. All were rejected and no claims were allowed. By this amendment claim 29 has been canceled, claims 37-41 have been added, and claims 15, 28, and 30 have been amended. Accordingly, claims 15-28 and 30-41 are presently pending and before the examiner for consideration.

Rejections Under 35 U.S.C. § 112, First Paragraph

The Office Action rejected claims 15-26 and 28-35 for failing to meet the written description requirement because the negative limitation "not at the first depth" was alleged to "not seem to have support in the original disclosure." The examiner cites to MPEP 2173.05(i) about the use of negative limitations. Applicant respectfully disagrees with this rejection and points out that MPEP 2173.05(i) clearly indicates that "...there is nothing inherently ambiguous or uncertain about a negative limitation." The bounds of the limitation "not at the first depth" are clear and adequately described in the specification. For example, claim 15 recites "...at least one water intake positioned in the body of seawater at a first depth..." and "...at least one discharge port being positioned at a site not at the first depth." If the first depth is 30 meters below the surface of a body of water, then the site not a first depth is any other than 30 meters below the surface of the body of water, e.g., at the surface, 10 meters above the surface, 20 meters below the surface, 50 meters below the surface, etc. While perhaps not *ipsis verbis*, adequate written

description¹ support for this limitation is clearly found in the application, notably in Figs. 6B and paragraph [0131].

The Office Action rejected claims 24 and 25 as not being enabled for allegedly not providing sufficient details of the instruments and sensors for one of ordinary skill in the art to determine the depth of a thermocline or plankton in a body of water. Applicant disagrees with this assertion as instruments and sensors for determining the depth of a thermocline or plankton that would be suitable for the claimed invention were well known at the time the application was filed and the enablement requirement does not require one to describe the details of technology that was well known in the art at the time the application was filed.² An example of instruments and sensors for determining the depth of a thermocline is described in US 5,834,641 to Sternal. A number of different optical and acoustic devices for detecting plankton in a body of water were also well known before the application was filed.³ Accordingly, the teaching of the present application is clearly sufficient to enable a person of skill in this art how to make and use the invention of claims 24 and 25 without undue experimentation.

Rejection Under 35 U.S.C. §§102 or 103 In View of Bosley

¹ See MPEP 2163 regarding guidelines for the written description requirement. "If a skilled artisan would have understood the inventor to be in possession of the claimed invention at the time of filing, even if every nuance of the claims is not explicitly described in the specification, then the adequate description requirement is met. See, e.g., *Vas-Cath*, 935 F.2d at 1563, 19 USPQ2d at 1116; *Martin v. Johnson*, 454 F.2d 746, 751, 172 USPQ 391, 395 (CCPA 1972) (stating "the description need not be in *ipsis verbis* [i.e., "in the same words"] to be sufficient")."

² A patent need not teach, and preferably omits, what is well known in the art. *In re Buchner*, 929 F.2d 660, 661, 18 USPQ2d 1331, 1332 (Fed. Cir. 1991); *Hybritech, Inc. v. Monoclonal Antibodies, Inc.*, 802 F.2d 1367, 1384, 231 USPQ 81, 94 (Fed. Cir. 1986), *cert. denied*, 480 U.S. 947 (1987); and *Lindemann Maschinenfabrik GMBH v. American Hoist & Derrick Co.*, 730 F.2d 1452, 1463, 221 USPQ 481, 489 (Fed. Cir. 1984).

³ See, e.g., Ashjian et al., "Distribution of plankton, particles, and hydrographic features across Georges Bank described using the Video Plankton Recorder." *Deep-Sea Research Part II-Topical Studies in Oceanography*. 48 (1-3), 2001; Benfield et al. "ZOOVIS: a high resolution digital camera system for quantifying zooplankton abundance and environmental data". *American Society of Limnology and Oceanography*, 2001 Aquatic Sciences Meeting, Albuquerque, NM, February 12-17, 2001; Davis et al. "Microaggregations of Oceanic Plankton Observed by Towed Video Microscopy", *Science* 257, 1992; Flagg and Smith, "On the use of the Acoustic Doppler current profiler to measure zooplankton abundance," *Deep Sea Res.* 36, 1989.

In the Office Action, claims 28, 29, 31, and 32 were rejected as being anticipated by or obvious over Bosley (US 6,348,148). The Office Action argues that Bosley at Col. 4, ln. 65 teaches making desalinated water "on board a ship" and supports this with a parenthetical statement that a system "suspended" from a ship would be "on-board."⁴ Applicant has herewith amended the claims 28 and 30 to recite "on a sea-going vessel" rather than "aboard a sea-going vessel" to clarify that the claim is not intended to encompass a method utilizing Bosley's device secured to a location in a body of water by cables attached to ships.

Regarding claim 29, the Office Action argues that "[c]oncentrate is mixed with seawater at discharge" and points to col. 4, lns. 1-20 of Bosley. Although, claim 29 has herewith been canceled, independent claim 28 has been amended to recite "...diluting the concentrate with seawater to yield a diluted concentrate; discharging the *diluted* concentrate into the body of seawater at a site not at the first depth." Like canceled claim 29, amended claim 28 is not anticipated by Bosley because Bosley fails to teach (i) diluting the concentrate with seawater prior⁵ to the step of discharging or (ii) discharging diluted concentrate into the body of seawater. Bosley instead teaches using ocean current to mix undiluted concentrate with seawater after discharge. Regarding claim 30, Bosley's mixing after discharge is not the same as diluting the concentrate with seawater on the vessel.

Rejection Under 35 U.S.C. §§102 or 103 In View of Krylov

In the Office Action, claims 15 and 28-30 were rejected as being anticipated by or obvious over Krylov (US 6,658,889). A rejection of these claims based on §102 is clearly improper

⁴ For the purpose of this response, applicant has assumed the examiner uses "on-board" synonymously with claim 28's use of "aboard." If this assumption is incorrect, clarification is requested.

⁵ I.e., if *diluted* concentrate is discharged, a step of diluting the concentrate must occur prior to discharge.

because Krylov fails to teach limitations present in independent claims 15 and 28 (as previously presented or currently amended). For example, claim 15 recites “a concentrate discharge system ... comprising at least one discharge port,” and claim 28 discloses a step of “...discharging the diluted concentrate into the body of seawater at a site not at the first depth.” Krylov does not describe either a discharge port or a discharge step (of either undiluted or diluted concentrate). The Office Action appears to admit that these limitations are not expressly taught by Krylov, but argues that the reference *inherently* discloses these limitations by stating “...inherently, the ice slush would be discharged at some point.”

MPEP §2112 indicates “ [i]n relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art.’ *Ex parte Levy*, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990)” and “[t]he fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic. *In re Rijckaert*, 9 F.3d 1531, 1534, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993).” The examiner states Krylov inherently teaches discharge of the mixture, but does not provide any evidence supporting that any kind of discharge of ice slush would necessarily flow from Krylov. Moreover, the Office Action also fails to provide any evidence whatsoever showing that it is inherent that the ice slush discharge would be into a body of seawater as in claim 28 or via a discharge port as in claim 15.

Although it might be within the realm of possibility that (i) ice slush discharge, (ii) ice slush discharge into a body of seawater at a depth not at the first depth, and (iii) ice slush discharge via a discharge port may occur or be present in Krylov, because Krylov is entirely silent on what happens to the ice slush after being deposited in a fish storage tank (see Fig. 9), it

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clearly cannot be concluded that either (i)-(iii) necessarily flows from this reference. In fact, numerous other possibilities exist. First, Krylov's ice slush might never be discharged of at all. For example, Fig. 9 suggests that melted ice slush is routed from the fish holding compartment to the ice slush tube for refreezing. Second, even if it could be definitively proven that the ice slush was discharged, such discharge might be into a land-based facility rather than a body of seawater. Land-based disposal is the most logical inference from Krylov because, for the purpose of preserving freshness, it would be desirable to keep the ice slush in contact with the fish even after off-loading to a land-based facility. Third, referring back to the first point, if no discharge was contemplated, then no discharge port would be required. And even if discharge was contemplated, various means other than a discharge port could be used, e.g., a bucket attached to rope which could manually operated by a person on Krylov's vessel.

Rejection Under 35 U.S.C. § 103 In View of the Combination of Lampe and Bosley

The Office Action rejected claims 15-23 and 28-35 as being obvious over the combination of Lampe (PCS-Preussag Conversion Systems) and Bosley. Applicant respectfully disagrees with this rejection because the combination Lampe and Bosley fails to teach or suggest the mixing system of independent claim 15 or the step of discharging diluted concentrate of independent claim 28.⁶ Lampe is entirely silent with regard to these two limitations. Bosley does not teach or suggest claim 15's:

a mixing system ... installed on the first sea-going vessel ... and comprising a space in which concentrate can be mixed with seawater to form the diluted concentrate, an inlet for introducing concentrate into the space, an inlet for introducing seawater into the space, and an outlet for discharging the diluted concentrate from the space;

⁶ See *In re Vaack*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991) (Among the criteria for establishing a prima facie case of obviousness, the combined prior art references must teach or suggest all claim limitations).

Rather than having such a mixing system, Bosley's apparatus features only a discharge pipe which directs undiluted concentrate into a mid-water area of the ocean where ocean current is used to mix the discharged undiluted concentrate with the surrounding seawater. For this reason, Bosley also does not disclose a step of discharging diluted concentrate as recited in claim 28.

The Office Action urges that Bosley teaches that concentrate discharge can have a negative effect on the environment and that the solution to this problem is to mix the concentrate with seawater. A significant difference, however, exists between Bosley's and applicant's mixing of concentrate with seawater. Bosley simply dumps *undiluted* concentrate directly into a mid-water location in a body of water for dispersion by ocean current. In comparison, the present claims are directed to discharging concentrate *that has already been diluted*. Applicant's method allows significantly more control over the concentrate dilution process and thereby significantly more control over mitigating damage to the environment. This advantage is particularly important on a sea-going vessel-based desalination system that might operate at different locations having different geographies, some of which might not allow placement of a discharge pipe at a mid-water location (e.g., at a shallow location near shore) or at a location which exposes the discharged undiluted concentrate to an ocean current of sufficient strength to promote sufficient mixing to mitigate environmental damage. Neither Lampe nor Bosley appreciate or suggest the advantage of applicant's method. In fact, the most that the combination of Lampe and Bosley would suggest to an artisan skilled in this field would be to merely combine a ship-based system with a concentrate discharge pipe extending into the mid-water in an area with sufficient ocean current to mix the concentrate with surrounding seawater. The combination of these references in no way suggests applicant's invention because neither teaches

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or suggests the desirability of diluting concentrate before discharge. Thus the combined references cannot render the presently claimed invention obvious within the meaning of 35 U.S.C. §103.

Regarding the rejected claims that depend from claims 15 and 28, the Office Action admits that the combination of Lampe and Bosley fails to teach a number of the limitations recited therein,⁷ but argues that the missing limitations each have equivalents described in Bosley and that in view of *In re Fout*,⁸ Lampe and Bosley need not expressly suggest substituting the alleged equivalent components. Applicant disagrees with this argument for the reasons presented below.

Claim 16 recites "...the first sea-going vessel has a draught of more than 10 meters and the apparatus for taking up seawater from the body of seawater comprises a sea chest formed in the lower portion of the hull of the first sea-going vessel." Neither Lampe nor Bosley teach these limitations or any equivalent of these limitations. Relying on *Gardner v. TEC Systems*,⁹ the Office Action argues that the limitation of the "...vessel having a draught of 10 meters- this pertains only to the size of the ship, which is not patentable." The foregoing implies that *Gardner* stands for the general proposition that recitation of the size of a claim element cannot render the claim patentable. Claim 16, however, is not limited to merely a ship having a particular draft, but recites among other things the particular draft in combination with a sea chest. As the Office Action notes, the court in *Gardner* held that where the only difference between the prior art and the claimed subject matter was a recitation of relative dimensions of the

⁷ The particular location of the water intake and concentrate discharge, the intake at below the thermocline region and discharge above, the concentrate discharge having a plurality of ports, a mixing space aboard the ship, a sea-going vessel having a draft of 10 meters, and a sea chest.
675 F. 2d 297 (CCPA 1982).

⁸ 725 F.2d 1338 (Fed. Cir. 1984).

claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device was not patentably distinct from the prior art device. In the present case, the cited dimensions relate to intake at a preferred depth with respect to a thermocline or plankton layer and are important for performance of the claimed desalination system. To illustrate, in a case where the plankton level is very near the surface of a body of water, a vessel with a draught of less than 3 meters and a sea chest intake would not likely be able to minimize plankton intake, whereas one with a draught of greater than 10 meters would. Thus, referring again to the *Gardner* case, the relevant dimension in this case could cause the vessel to perform differently.

Regarding claim 17, neither Lampe nor Bosley teach or suggest a "...water intake member extendible from the hull into the body of seawater, wherein the water intake is on the distal end of the water intake member and the first depth is greater than ten meters" or any equivalent thereof. The Office Action does not provide a specific reason for this rejection. Clarification is requested.

Regarding claim 19, neither Lampe nor Bosley teach or suggest a discharge port at the indicated site. Moreover, in Bosley's device, discharge of concentrate at a depth shallower than the intake would appear to defeat the purpose of its mid-water discharge. Lampe and Bosley also fail to teach or suggest claim 20's "...wherein the at least one discharge port is positioned in or below a thermocline and the first depth is above the thermocline;" claim 21's "...wherein the at least one discharge port is positioned above a thermocline and the first depth is in or below the thermocline;" claim 22's "...wherein the water intake is movable such that the water intake system can intake water from various depths to reduce the intake of plankton;" or claim 23's "...wherein the first sea-going vessel comprises a sea chest formed in the lower portion of the

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hull of the first sea-going vessel and a water intake member extendible from the hull into the body of seawater, and the water intake system can utilize either the sea chest or the water intake member to intake seawater.”

As to claims 29-31 and 33-35 (claim 29 has herewith been canceled, but applicants request clarification of the rejection) which depend from claim 28, applicant does not believe that any of these additional limitations are taught or suggested by Lampe or Bosley.

Each of the limitations in the foregoing dependent claims provides advantages to the subject desalination system depending on its particular application. None of these advantages are appreciated by Lampe or Bosley. Further, the Office Action does not provide specific reasons for these rejections. In order for the applicant to form a comprehensive response to each of these rejections, the specific reason for the rejection of each of these dependent claims is requested. The Office Action appears to argue that equivalents for each of these limitations are found in Lampe or Bosley and cites to *In re Fout* for the proposition that an express suggestion to substitute one equivalent for another is not necessary to render such substitution obvious. Applicant respectfully disagrees that equivalents for these limitations are found in Lampe or Bosley and requests that the examiner either withdraw the rejection or more clearly describe all of the components/steps in Lampe or Bosley that are equivalent to the limitations in the foregoing claims so that applicant can form a pointed response to this rejection rather than a general demurrer.

Rejection Under 35 U.S.C. § 103 In View of the Combination of Lampe, Bosley, and Husick

The Office Action rejected claims 26, 27 and 36 as being obvious over the combination of Lampe, Bosley, and Husick (US 5,830,366). More particularly, the Office Actions states that

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Husick teaches an aspirator or jet pump for mixing waste water and that it would have been obvious to use this teaching in the combination of Lampe and Bosley. The Office Action fails to make out a prima facie case of obviousness because it does not state any motivation or suggestion to combine Husick's jet pump with the teachings of Lampe and Bosley.¹⁰ Applicant cannot find anything in Lampe or Bosley which suggests it would be advantageous or useful to add Husick's jet pump. Applicant also cannot fathom why one of skill in the art who has envisioned Lampe's system in combination with Bosley's would look to Husick for a jet pump. Withdrawal of the rejection or recitation of the suggestion/motivation to combine Husick with Lampe and Bosley is therefore requested.

New Claims

New claims 37-41 are believed patentable over the prior art. None of the references cited in the Office Action teach a means for regulating the salinity level of the concentrate to a level substantially equal to the salinity level of the seawater at the area where the concentrate is discharged or a means for regulating the temperature of the concentrate substantially equal to the temperature of the seawater at the area where the concentrate is discharged.

Conclusion

In view of the foregoing, reconsideration of the outstanding rejections is requested as the currently pending claims are supported throughout the specification and are patentable over the

¹⁰ See MPEP §2143 ("...there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings.")


prior art. No new matter has been added. This application is now in full condition for allowance, and such action is respectfully requested.

The Commissioner is hereby authorized to charge any underpayment or credit any overpayment of fees under 37 CFR 1.16 or 1.17 as required by this paper to Deposit Account 50-3110.

The examiner is cordially invited to call the undersigned if clarification is needed on any matter within this response, or if the examiner believes a telephone interview would expedite the prosecution of the subject application to completion.

Respectfully submitted,

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